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LAW OFFICES OF JONATHAN ALAN QUINE

By

Tracie Brooks
Tracie Brooks

Attorney Docket No. 02-031910US

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:

Juha Punnonen, et al.

Application No.: 09/886,942

Filed: June 21, 2001

For: NOVEL CHIMERIC PROMOTERS

Examiner: Unassigned

Art Unit: 1645

LETTER TO OFFICIAL DRAFTSPERSON

Attn: Box Missing Parts
Assistant Commissioner for Patents
Washington, D.C. 20231

Sir:

Applicant hereby submits 23 sheets of formal drawings to be made of record in the above-identified case.

Respectfully submitted,

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Figure 1: Screening libraries of chimeric promoter sequences

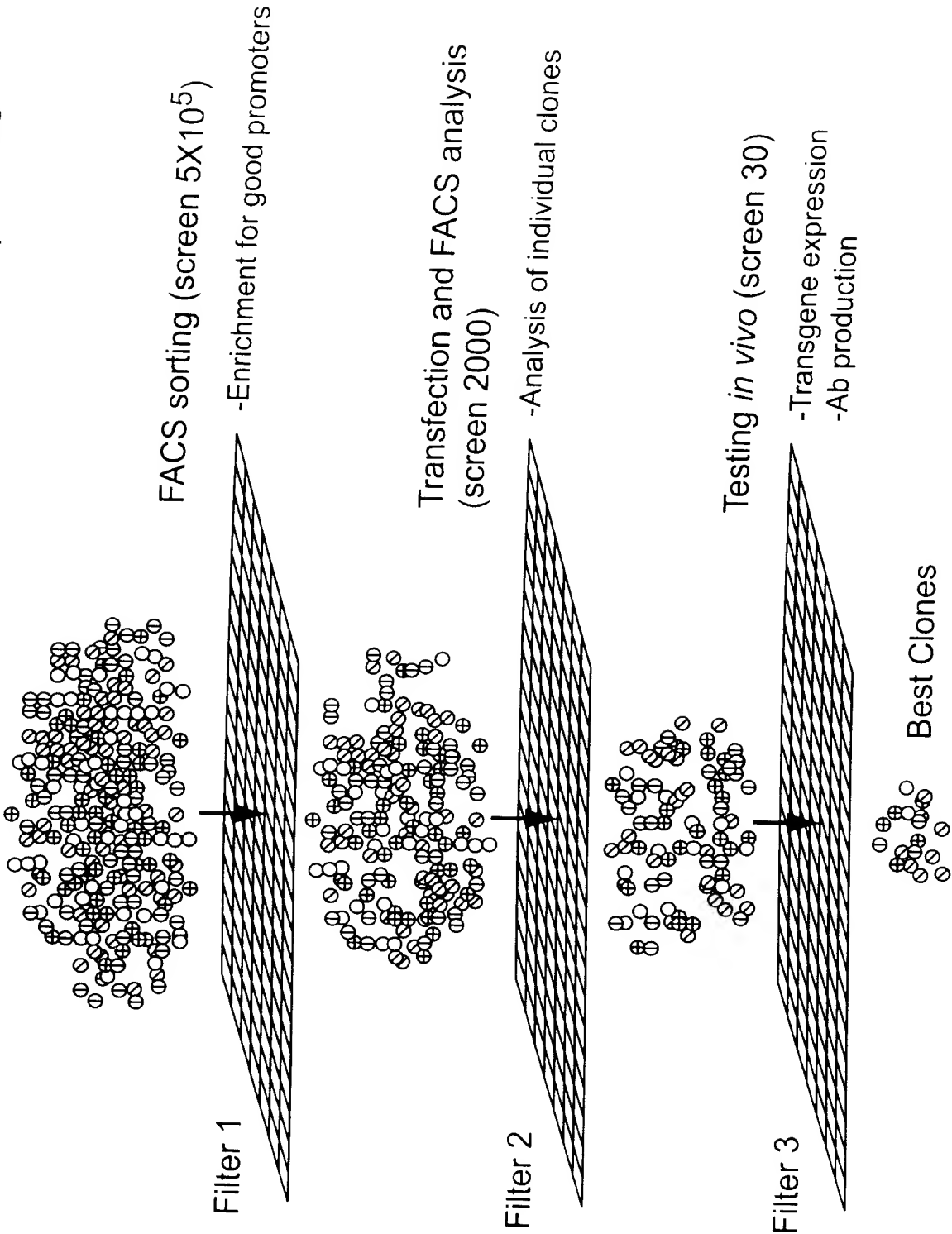


Figure 2: Enrichment of chimeric promoter libraries by FACS sorting

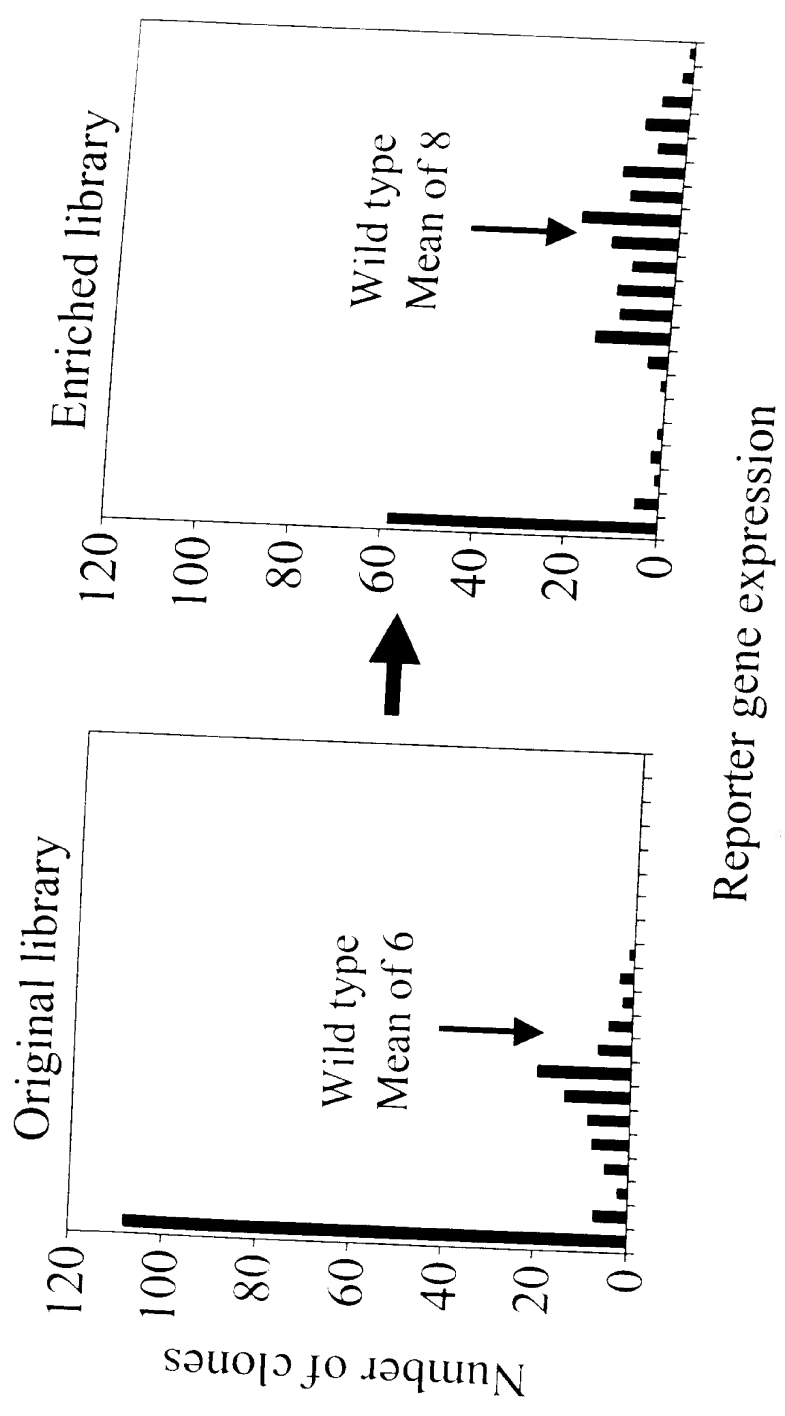


Figure 3: Diverse activities of chimeric promoter sequences in transfected cells

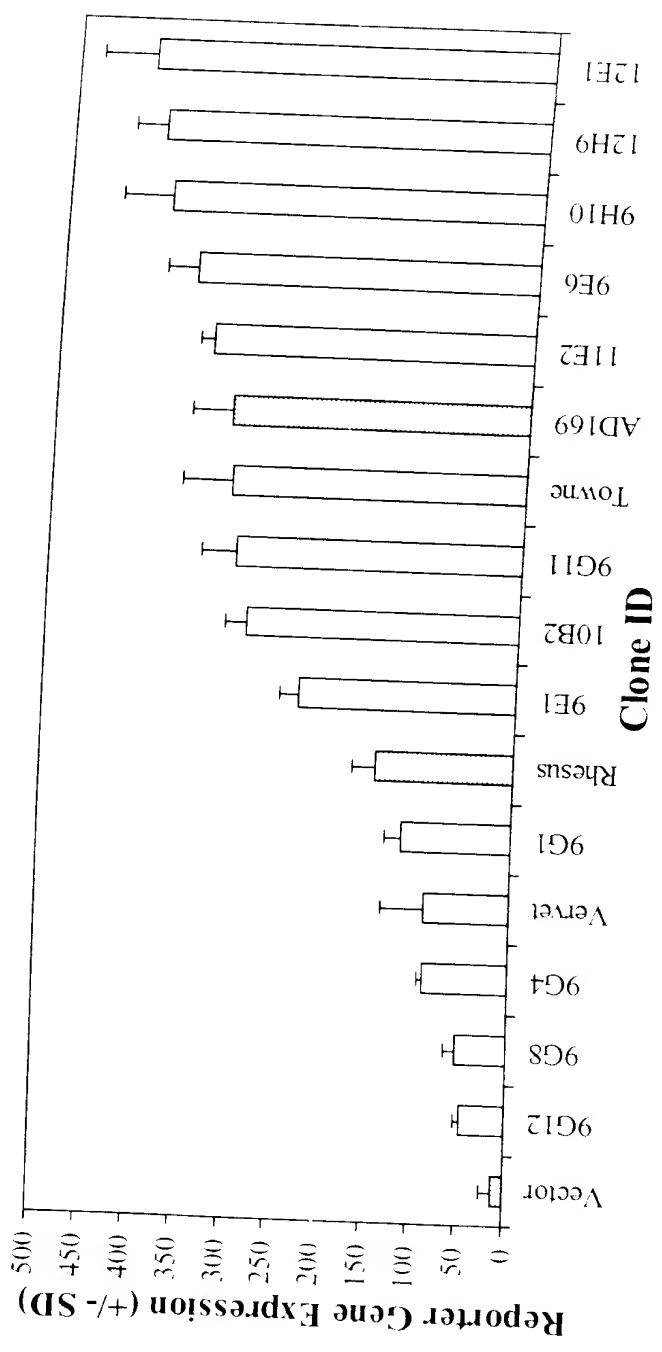


Figure 4: Luciferase expression in muscle 7 days after plasmid injection

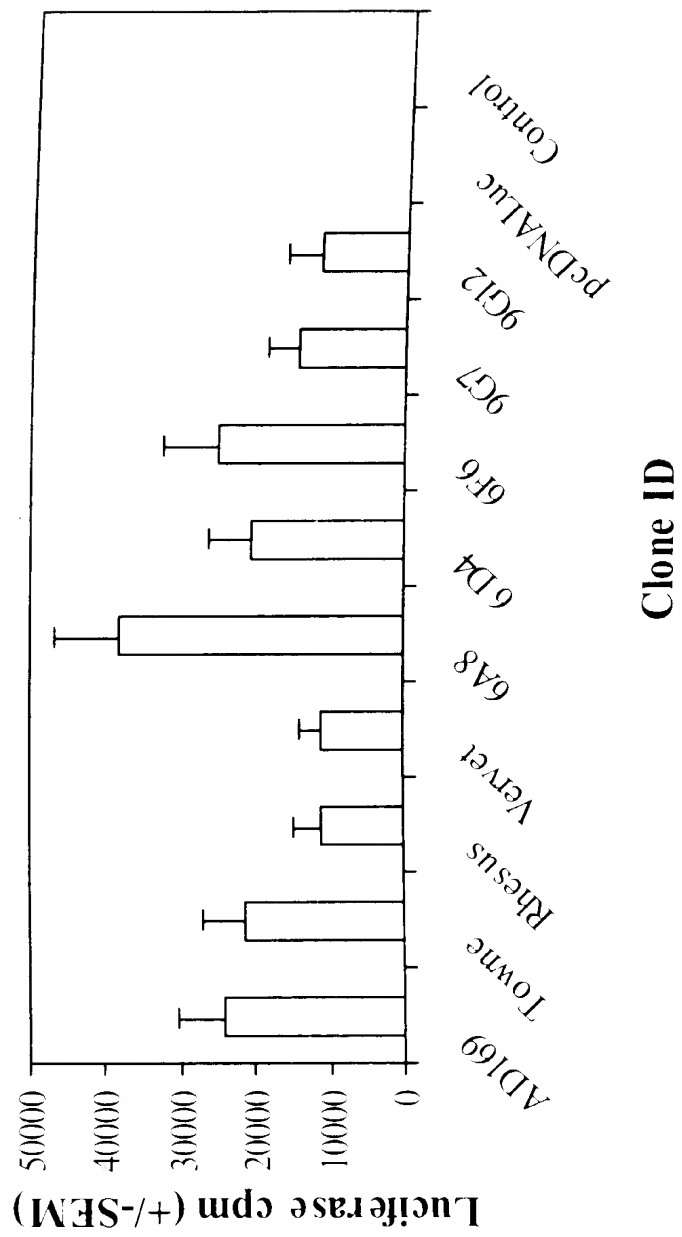


Figure 5: Comparison of Luciferase expression from clone 6A8 and parental clones

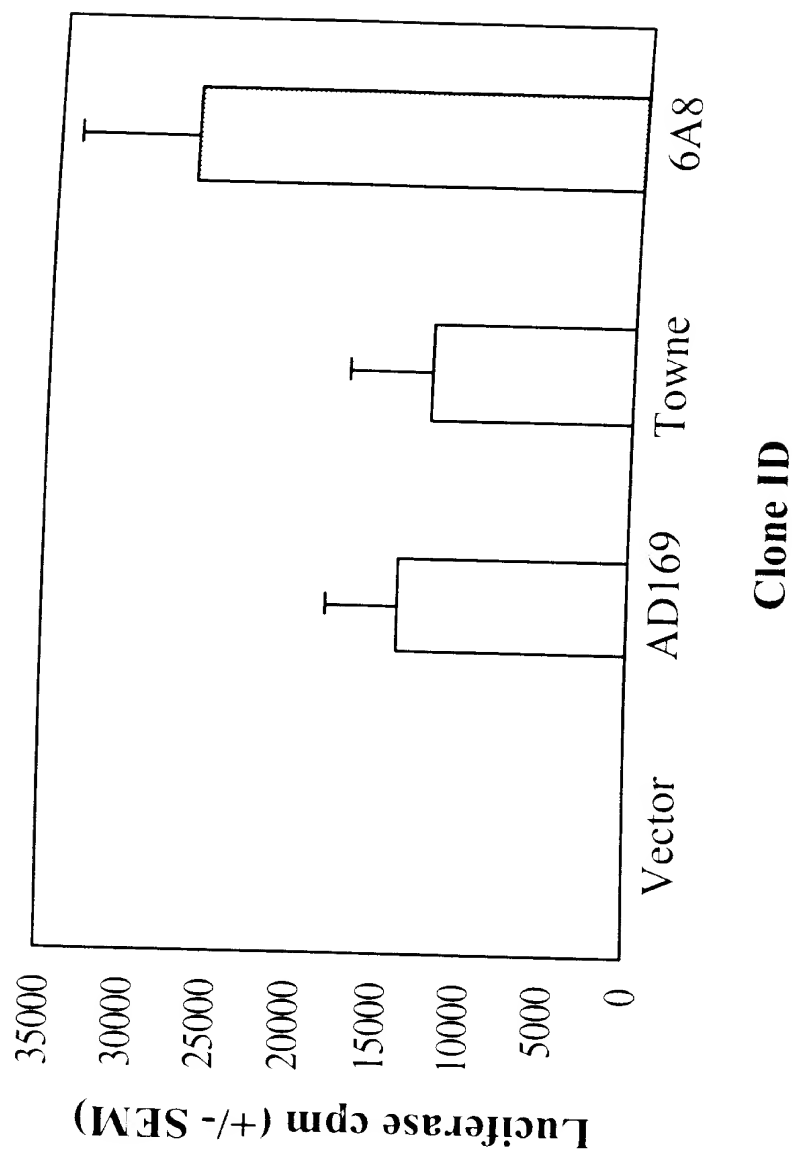


Figure 6A: Antibody responses following injection with β -galactosidase-encoding plasmid

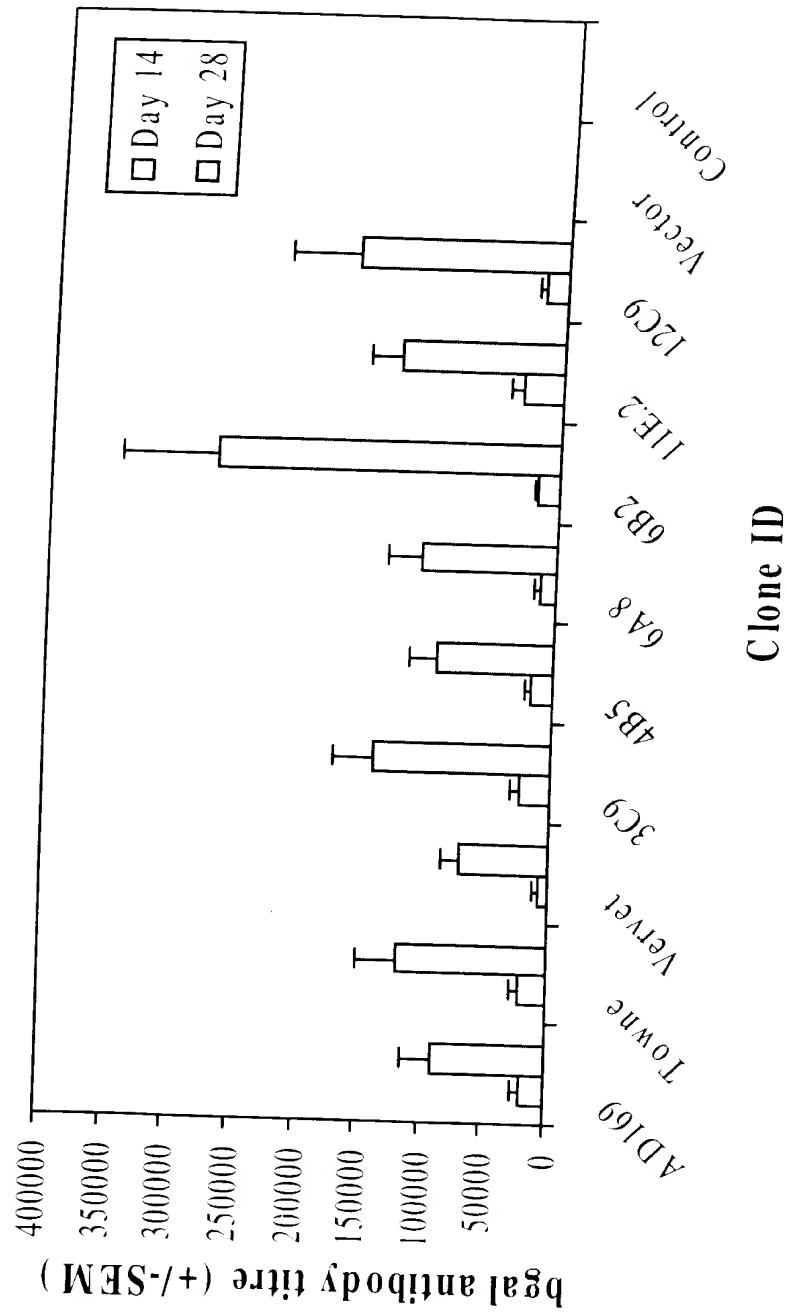


Figure 6B: Improved Ab Response by Shuffled Promoter

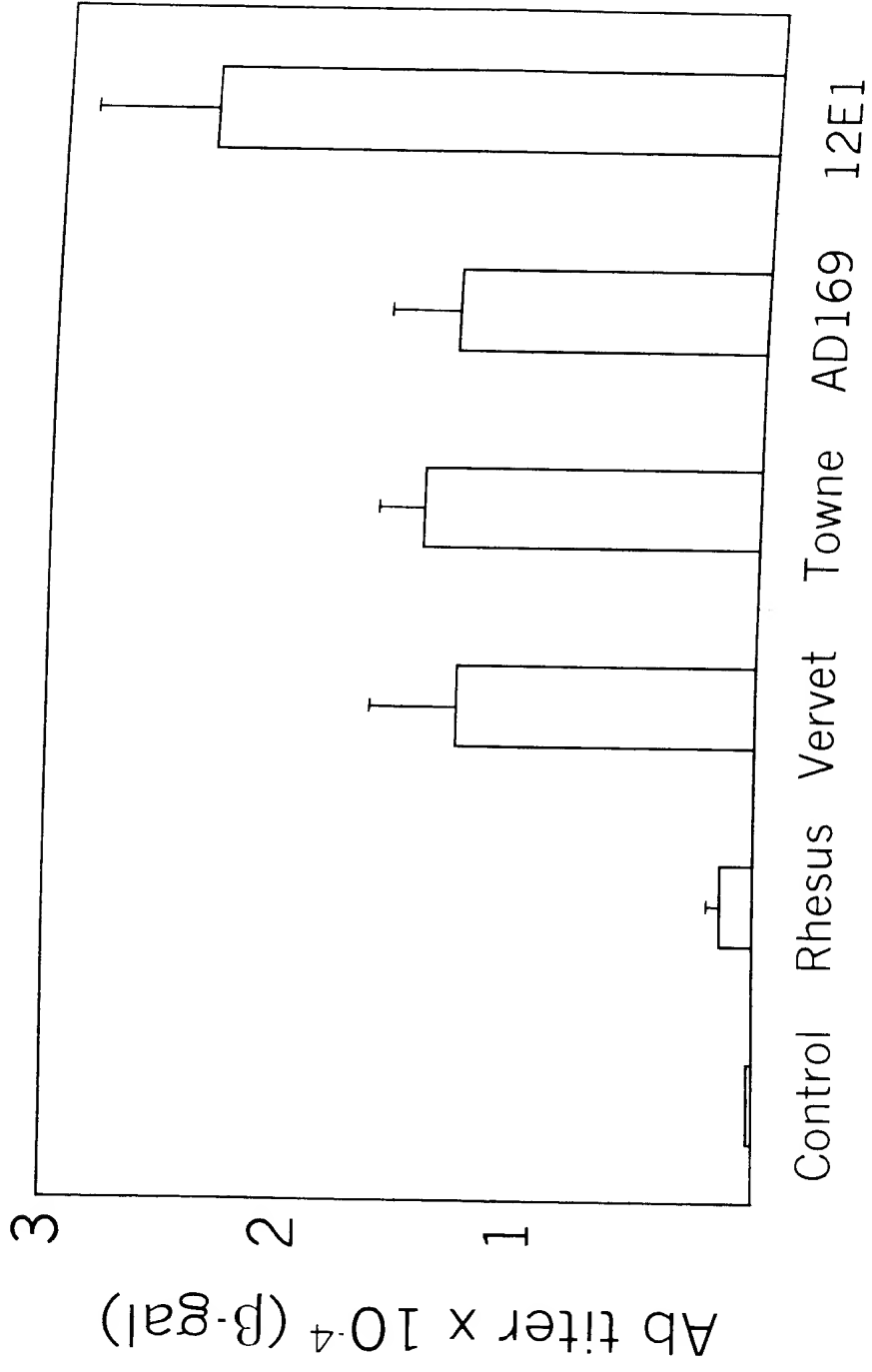


Figure 7: Chimeric promoter 6A8 is functional in human muscle tissue

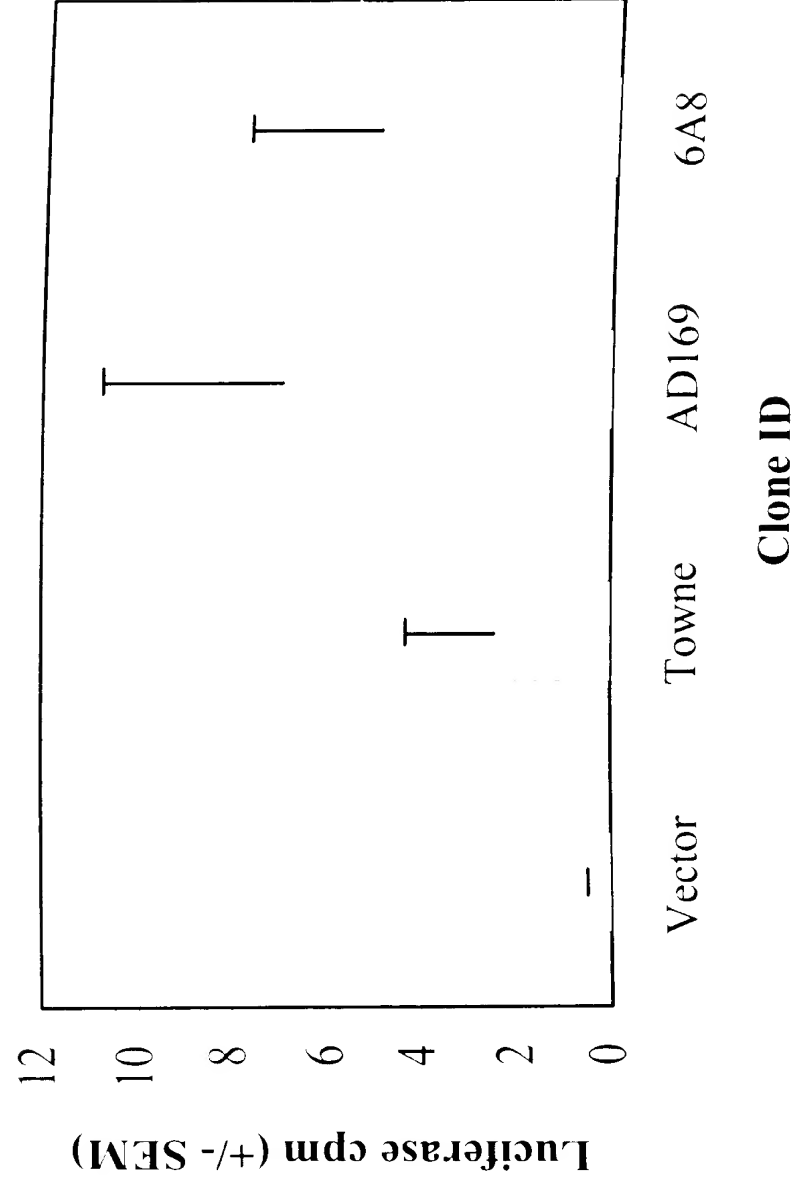


Figure 8A: Comparison of 18 chimeric promoter sequences generated by DNA shuffling using CMV promoter nucleic acid sequences from AD169 and Towne human strains and Rhesus and Vervet monkey strains as parental sequences.

10B2	(1)	ATATGAGGCTATATCGCCGATAGAGCGGACATCAAGCTGGCACATGGCCAAATGCATATCGATCTATACATTAAATCAATATTGGCAATTAGCCATATTG	1
11B2	(1)	ATATGAGGCTATATCGCCGATATAGGCGACATCAAGCTGGCACATAGCCAAATGCATATCGATCTATAGTTGAATCAATATTGGCAATTAGCCATATTG	100
12C9	(1)	ATATGAGGCTATATCGCCGATAGAGCGGACATCAAGCTGGCACATAGCCAAATGCATATCGATCTATAGTTGAATCAATATTGGCAATTAGCCATATTG	
12E1	(1)	ATATGAGGCTATATCGCCGATAGAGCGGACATCAAGCTGGCACATAGCCAAATGCATATCGATCTATAGTTGAATCAATATTGGCAATTAGCCATATTG	
12H9	(1)	ATATGAGGCTATATCGCCGATAGAGCGGACATCAAGCTGGCACATAGCCAAATGCATATCGATCTATAGTTGAATCAATATTGGCAATTAGCCATATTG	
3C9	(1)	ATATGAGGCTATATCGCCGATAGAGCGGACATCAAGCTGGCACATAGCCAAATGCATATCGATCTATAGTTGAATCAATATTGGCAATTAGCCATATTG	
4B5	(1)	ATATGAGGCTATATCGCCGATAGAGCGGACATCAAGCTGGCACATAGCCAAATGCATATCGATCTATAGTTGAATCAATATTGGCAATTAGCCATATTG	
6A8	(1)	ATATGAGGCTATATCGCCGATAGAGCGGACATCAAGCTGGCACATAGCCAAATGCATATCGATCTATAGTTGAATCAATATTGGCAATTAGCCATATTG	
6B2	(1)	ATATGAGGCTATATCGCCGATAGAGCGGACATCAAGCTGGCACATAGCCAAATGCATATCGATCTATAGTTGAATCAATATTGGCAATTAGCCATATTG	
6D4	(1)	ATATGAGGCTATATCGCCGATAGAGCGGACATCAAGCTGGCACATAGCCAAATGCATATCGATCTATAGTTGAATCAATATTGGCAATTAGCCATATTG	
6F6	(1)	ATATGAGGCTATATCGCCGATAGAGCGGACATCAAGCTGGCACATAGCCAAATGCATATCGATCTATAGTTGAATCAATATTGGCAATTAGCCATATTG	
9E1	(1)	ATATGAGGCTATATCGCCGATAGAGCGGACATCAAGCTGGCACATAGCCAAATGCATATCGATCTATAGTTGAATCAATATTGGCAATTAGCCATATTG	
9F11	(1)	ATATGAGGCTATATCGCCGATAGAGCGGACATCAAGCTGGCACATAGCCAAATGCATATCGATCTATAGTTGAATCAATATTGGCAATTAGCCATATTG	
9G11	(1)	ATATGAGGCTATATCGCCGATAGAGCGGACATCAAGCTGGCACATAGCCAAATGCATATCGATCTATAGTTGAATCAATATTGGCAATTAGCCATATTG	
9G12	(1)	ATATGAGGCTATATCGCCGATAGAGCGGACATCAAGCTGGCACATAGCCAAATGCATATCGATCTATAGTTGAATCAATATTGGCAATTAGCCATATTG	
9G4	(1)	ATATGAGGCTATATCGCCGATAGAGCGGACATCAAGCTGGCACATAGCCAAATGCATATCGATCTATAGTTGAATCAATATTGGCAATTAGCCATATTG	
9G7	(1)	ATATGAGGCTATATCGCCGATAGAGCGGACATCAAGCTGGCACATAGCCAAATGCATATCGATCTATAGTTGAATCAATATTGGCAATTAGCCATATTG	
9G8	(1)	ATATGAGGCTATATCGCCGATAGAGCGGACATCAAGCTGGCACATAGCCAAATGCATATCGATCTATAGTTGAATCAATATTGGCAATTAGCCATATTG	
AD169	(1)	ATATGAGGCTATATCGCCGATAGAGCGGACATCAAGCTGGCACATAGCCAAATGCATATCGATCTATAGTTGAATCAATATTGGCAATTAGCCATATTG	
Towne	(1)	ATATGAGGCTATATCGCCGATAGAGCGGACATCAAGCTGGCACATAGCCAAATGCATATCGATCTATAGTTGAATCAATATTGGCAATTAGCCATATTG	
consensus	(1)	ATATGAGGCTATATCGCCGATAGAGCGGACATCAAGCTGGCACATAGCCAAATGCATATCGATCTATAGTTGAATCAATATTGGCAATTAGCCATATTG	
10B2	(101)	TCATTGGTTATATAGCATAAATCAATATTGGCTATTGGCCATTGCATACGTTGTATCTATATCATATATGATACATTTATATTGGCTCATGTCCCAATAG	200
11B2	(101)	TCATTGGTTATATAGCATAAATCAATATTGGCTATTGGCCATTGCATACGTTGTATCTATATCATATATGATACATTTATATTGGCTCATGTCCCAATAG	
12C9	(101)	TCATTGGTTATATAGCATAAATCAATATTGGCTATTGGCCATTGCATACGTTGTATCTATATCATATATGATACATTTATATTGGCTCATGTCCCAATAG	
12E1	(101)	TCATTGGTTATATAGCATAAATCAATATTGGCTATTGGCCATTGCATACGTTGTATCTATATCATATATGATACATTTATATTGGCTCATGTCCCAATAG	
12H9	(101)	TCATTGGTTATATAGCATAAATCAATATTGGCTATTGGCCATTGCATACGTTGTATCTATATCATATATGATACATTTATATTGGCTCATGTCCCAATAG	
3C9	(101)	TCATTGGTTATATAGCATAAATCAATATTGGCTATTGGCCATTGCATACGTTGTATCTATATCATATATGATACATTTATATTGGCTCATGTCCCAATAG	
4B5	(101)	TCATTGGTTATATAGCATAAATCAATATTGGCTATTGGCCATTGCATACGTTGTATCTATATCATATATGATACATTTATATTGGCTCATGTCCCAATAG	
6A8	(101)	TCATTGGTTATATAGCATAAATCAATATTGGCTATTGGCCATTGCATACGTTGTATCTATATCATATATGATACATTTATATTGGCTCATGTCCCAATAG	
6B2	(101)	TCATTGGTTATATAGCATAAATCAATATTGGCTATTGGCCATTGCATACGTTGTATCTATATCATATATGATACATTTATATTGGCTCATGTCCCAATAG	
6D4	(101)	TCATTGGTTATATAGCATAAATCAATATTGGCTATTGGCCATTGCATACGTTGTATCTATATCATATATGATACATTTATATTGGCTCATGTCCCAATAG	
6F6	(101)	TCATTGGTTATATAGCATAAATCAATATTGGCTATTGGCCATTGCATACGTTGTATCTATATCATATATGATACATTTATATTGGCTCATGTCCCAATAG	
9E1	(101)	TCATTGGTTATATAGCATAAATCAATATTGGCTATTGGCCATTGCATACGTTGTATCTATATCATATATGATACATTTATATTGGCTCATGTCCCAATAG	
9F11	(101)	TCATTGGTTATATAGCATAAATCAATATTGGCTATTGGCCATTGCATACGTTGTATCTATATCATATATGATACATTTATATTGGCTCATGTCCCAATAG	
9G11	(101)	TCATTGGTTATATAGCATAAATCAATATTGGCTATTGGCCATTGCATACGTTGTATCTATATCATATATGATACATTTATATTGGCTCATGTCCCAATAG	
9G12	(101)	TCATTGGTTATATAGCATAAATCAATATTGGCTATTGGCCATTGCATACGTTGTATCTATATCATATATGATACATTTATATTGGCTCATGTCCCAATAG	
9G4	(101)	TCATTGGTTATATAGCATAAATCAATATTGGCTATTGGCCATTGCATACGTTGTATCTATATCATATATGATACATTTATATTGGCTCATGTCCCAATAG	
9G7	(101)	TCATTGGTTATATAGCATAAATCAATATTGGCTATTGGCCATTGCATACGTTGTATCTATATCATATATGATACATTTATATTGGCTCATGTCCCAATAG	
9G8	(101)	TCATTGGTTATATAGCATAAATCAATATTGGCTATTGGCCATTGCATACGTTGTATCTATATCATATATGATACATTTATATTGGCTCATGTCCCAATAG	
AD169	(101)	TCATTGGTTATATAGCATAAATCAATATTGGCTATTGGCCATTGCATACGTTGTATCTATATCATATATGATACATTTATATTGGCTCATGTCCCAATAG	
Towne	(101)	TCATTGGTTATATAGCATAAATCAATATTGGCTATTGGCCATTGCATACGTTGTATCTATATCATATATGATACATTTATATTGGCTCATGTCCCAATAG	
consensus	(101)	TCATTGGTTATATAGCATAAATCAATATTGGCTATTGGCCATTGCATACGTTGTATCTATATCATATATGATACATTTATATTGGCTCATGTCCCAATAG	

[illegible]

Figure 8C: Comparison of 18 chimeric promoter sequences generated by DNA shuffling using CMV promoter nucleic acid sequences from AD169 and Towne human strains and Rhesus and Vervet monkey strains as parental sequences.

10B2	(401)	GACCTCAATGGGTGGAGTATTTACGGTAAACTGCCCACTTGGCAGTACATCAAGTGATCATATGCCAAGTCGG-CCCCCTATTGACGTCAATGACGGTA	500
11E2	(401)	GACGTCAATGGGTGGAGTATTTACGGTAAACTGCTCACTTGGCAGTACATCAAGTGATCATATGCCAAGTACG-CCCCCTATTGACGTCAATGACGGTA	
12C9	(401)	GACGTCAATGGGTGGAGTATTTACGGTAAACTGCCCACTTGGCAGTACATCAAGTGATCATATGCCAAGTCGG-CCCCCTATTGACGTCAATGACGGTA	
12E1	(401)	GACGTCAATGGGTGGAGTATTTACGGTAAACTGCCCACTTGGCAGTACATCAAGTGATCATATGCCAAGTCGG-CCCCCTATTGACGTCAATGACGGTA	
12H9	(401)	GACGTCAATGGGTGGAGTATTTACGGTAAACTGCCCACTTGGCAGTACATCAAGTGATCATATGCCAAGTCGG-CCCCCTATTGACGTCAATGACGGTA	
3C9	(401)	GACGTCAATGGGTGGAGTATTTACGGTAAACTGCCCACTTGGCAGTACATCAAGTGATCATATGCCAAGTCGG-CCCCCTATTGACGTCAATGACGGTA	
4B5	(401)	GACGTCAATGGGTGGAGTATTTACGGTAAACTGCCCACTTGGCAGTACATCAAGTGATCATATGCCAAGTCGG-CCCCCTATTGACGTCAATGACGGTA	
6A8	(401)	GACGTCAATGGGTGGAGTATTTACGGTAAACTGCCCACTTGGCAGTACATCAAGTGATCATATGCCAAGTCGG-CCCCCTATTGACGTCAATGACGGTA	
6B2	(401)	GACGTCAATGGGTGGAGTATTTACGGTAAACTGCCCACTTGGCAGTACATCAAGTGATCATATGCCAAGTCGG-CCCCCTATTGACGTCAATGACGGTA	
6D4	(401)	GACGTCAATGGGTGGAGTATTTACGGTAAACTGCCCACTTGGCAGTACATCAAGTGATCATATGCCAAGTCGG-CCCCCTATTGACGTCAATGACGGTA	
6F6	(401)	GACGTCAATGGGTGGAGTATTTACGGTAAACTGCCCACTTGGCAGTACATCAAGTGATCATATGCCAAGTCGG-CCCCCTATTGACGTCAATGACGGTA	
9E1	(319)	-----	
9F11	(401)	GACGTCAATGGGTGGAGTATTTACGGTAAACTGCCCACTTGGCAGTACATCAAGTGATCATATGCCAAGTCGG-CCCCCTATTGACGTCAATGACGGTA	
9G11	(401)	GACGTCAATGGGTGGAGTATTTACGGTAAACTGCCCACTTGGCAGTACATCAAGTGATCATATGCCAAGTCGG-CCCCCTATTGACGTCAATGACGGTA	
9G12	(401)	GACGTCAATGGGTGGAGTATTTACGGTAAACTGCCCACTTGGCAGTACATCAAGTGATCATATGCCAAGTCGG-CCCCCTATTGACGTCAATGACGGTA	
9G4	(401)	GACGTCAATGGGTGGAGTATTTACGGTAAACTGCCCACTTGGCAGTACATCAAGTGATCATATGCCAAGTCGG-CCCCCTATTGACGTCAATGACGGTA	
9G7	(401)	GACGTCAATGGGTGGAGTATTTACGGTAAACTGCCCACTTGGCAGTACATCAAGTGATCATATGCCAAGTCGG-CCCCCTATTGACGTCAATGACGGTA	
9G8	(401)	GACGTCAATGGGTGGAGTATTTACGGTAAACTGCCCACTTGGCAGTACATCAAGTGATCATATGCCAAGTCGG-CCCCCTATTGACGTCAATGACGGTA	
AD169	(401)	GACGTCAATGGGTGGAGTATTTACGGTAAACTGCCCACTTGGCAGTACATCAAGTGATCATATGCCAAGTCGG-CCCCCTATTGACGTCAATGACGGTA	
Towne	(400)	GACGTCAATGGGTGGAGTATTTACGGTAAACTGCCCACTTGGCAGTACATCAAGTGATCATATGCCAAGTCGG-CCCCCTATTGACGTCAATGACGGTA	
consensus	(401)	GACGTCAATGGGTGGAGTATTTACGGTAAACTGCCCACTTGGCAGTACATCAAGTGATCATATGCCAAGTCGG-CCCCCTATTGACGTCAATGACGGTA	501
10B2	(500)	AATGGCCCGCCTGGCATTATGCCCCAGTACATGACCTTACGGGGCTTTCCTACTTGGCAGTACATCTAGCTATTAGTCATCGCTATTACCATGCTGATGCG	600
11E2	(500)	AATGGCCCGCCTGGCATTATGCCCCAGTACATGACCTTACGGGACTTTCCTACTTGGTAGTACATCTAGCTATTAGTCATCGCTATTACCATGCTGATGCG	
12C9	(500)	AATGGCCCGCCTGGCATTATGCCCCAGTACATGACCTTACGGGACTTTCCTACTTGGCAGTACATCTAGCTATTAGTCATCGCTATTACCATGCTGATGCG	
12E1	(500)	AATGGCCCGCCTGGCATTATGCCCCAGTACATGACCTTACGGGACTTTCCTACTTGGCAGTACATCTAGCTATTAGTCATCGCTATTACCATGCTGATGCG	
12H9	(500)	AATGGCCCGCCTGGCATTATGCCCCAGTACATGACCTTACGGGACTTTCCTACTTGGCAGTACATCTAGCTATTAGTCATCGCTATTACCATGCTGATGCG	
3C9	(501)	AATGGCCCGCCTGGCATTATGCCCCAGTACATGACCTTACGGGACTTTCCTACTTGGCAGTACATCTAGCTATTAGTCATCGCTATTACCATGCTGATGCG	
4B5	(500)	AATGGCCCGCCTGGCATTATGCCCCAGTACATGACCTTACGGGACTTTCCTACTTGGCAGTACATCTAGCTATTAGTCATCGCTATTACCATGCTGATGCG	
6A8	(500)	AATGGCCCGCCTGGCATTATGCCCCAGTACATGACCTTACGGGACTTTCCTACTTGGCAGTACATCTAGCTATTAGTCATCGCTATTACCATGCTGATGCG	
6B2	(500)	AATGGCCCGCCTGGCATTATGCCCCAGTACATGACCTTACGGGACTTTCCTACTTGGCAGTACATCTAGCTATTAGTCATCGCTATTACCATGCTGATGCG	
6D4	(500)	AATGGCCCGCCTGGCATTATGCCCCAGTACATGACCTTACGGGACTTTCCTACTTGGCAGTACATCTAGCTATTAGTCATCGCTATTACCATGCTGATGCG	
6F6	(500)	AATGGCCCGCCTGGCATTATGCCCCAGTACATGACCTTACGGGACTTTCCTACTTGGCAGTACATCTAGCTATTAGTCATCGCTATTACCATGCTGATGCG	
9E1	(319)	-----GGCATTATGCCCAGTACATGACCTTACGGGACTTTCCTACTTGGCAGTACATCTAGCTATTAGTCATCGCTATTACCATGCTGATGCG	
9F11	(500)	AATGGCCCGCCTGGCATTATGCCCCAGTACATGACCTTACGGGACTTTCCTACTTGGCAGTACATCTAGCTATTAGTCATCGCTATTACCATGCTGATGCG	
9G11	(500)	AATGGCCCGCCTGGCATTATGCCCCAGTACATGACCTTACGGGACTTTCCTACTTGGCAGTACATCTAGCTATTAGTCATCGCTATTACCATGCTGATGCG	
9G12	(500)	AATGGCCCGCCTGGCATTATGCCCCAGTACATGACCTTACGGGACTTTCCTACTTGGCAGTACATCTAGCTATTAGTCATCGCTATTACCATGCTGATGCG	
9G4	(500)	AATGGCCCGCCTGGCATTATGCCCCAGTACATGACCTTACGGGACTTTCCTACTTGGCAGTACATCTAGCTATTAGTCATCGCTATTACCATGCTGATGCG	
9G7	(500)	AATGGCCCGCCTGGCATTATGCCCCAGTACATGACCTTACGGGACTTTCCTACTTGGCAGTACATCTAGCTATTAGTCATCGCTATTACCATGCTGATGCG	
9G8	(500)	AATGGCCCGCCTGGCATTATGCCCCAGTACATGACCTTACGGGACTTTCCTACTTGGCAGTACATCTAGCTATTAGTCATCGCTATTACCATGCTGATGCG	
AD169	(500)	AATGGCCCGCCTGGCATTATGCCCCAGTACATGACCTTACGGGACTTTCCTACTTGGCAGTACATCTAGCTATTAGTCATCGCTATTACCATGCTGATGCG	
Towne	(500)	AATGGCCCGCCTGGCATTATGCCCCAGTACATGACCTTACGGGACTTTCCTACTTGGCAGTACATCTAGCTATTAGTCATCGCTATTACCATGCTGATGCG	
consensus	(501)	AATGGCCCGCCTGGCATTATGCCCCAGTACATGACCTTACGGGACTTTCCTACTTGGCAGTACATCTAGCTATTAGTCATCGCTATTACCATGCTGATGCG	

Figure 8D: Comparison of 18 chimeric promoter sequences generated by DNA shuffling using CMV promoter nucleic acid sequences from AD169 and Towne human strains and Rhesus and Vervet monkey strains as parental sequences.

	601	700
10B2	(600) GTTTTGGCACTACACCAATGGCGTGATAGCGTTTGACTCACGGGGAATTCCAAGTCTCCACCCATTGACGTCATGGAGTTCGTTTGGTACCAA	
11E2	(600) GTTTTGGCACTACACCAATGGCGTGATAGCGTTTGACTCACGGGGAATTCCAAGTCTCCACCCATTGACGTCATGGAGTTCGTTTGGTACCAA	
12C9	(600) GTTTTGGCACTACACCAATGGCGTGATAGCGTTTGACTCACGGGGAATTCCAAGTCTCCACCCATTGACGTCATGGAGTTCGTTTGGTACCAA	
12E1	(600) GTTTTGGCACTACACCAATGGCGTGATAGCGTTTGACTCACGGGGAATTCCAAGTCTCCACCCATTGACGTCATGGAGTTCGTTTGGTACCAA	
12H9	(600) GTTTTGGCACTACACCAATGGCGTGATAGCGTTTGACTCACGGGGAATTCCAAGTCTCCACCCATTGACGTCATGGAGTTCGTTTGGTACCAA	
3C9	(601) GTTTTGGCGGTACATCAATGGCGTGATAGCGTTTGACTCACGGGGAATTCCAAGTCTCCACCCATTGACGTCATGGAGTTCGTTTGGTACCAA	
4B5	(600) GTTTTGGCACTACATCAATGGCGTGATAGCGTTTGACTCACGGGGAATTCCAAGTCTCCACCCATTGACGTCATGGAGTTCGTTTGGTACCAA	
6A8	(600) GTTTTGGCACTACATCAATGGCGTGATAGCGTTTGACTCACGGGGAATTCCAAGTCTCCACCCATTGACGTCATGGAGTTCGTTTGGTACCAA	
6B2	(600) GTTTTGGCACTACATCAATGGCGTGATAGCGTTTGACTCACGGGGAATTCCAAGTCTCCACCCATTGACGTCATGGAGTTCGTTTGGTACCAA	
6D4	(600) GTTTTGGCACTACATCAATGGCGTGATAGCGTTTGACTCACGGGGAATTCCAAGTCTCCACCCATTGACGTCATGGAGTTCGTTTGGTACCAA	
6F6	(600) GTTTTGGCACTACATCAATGGCGTGATAGCGTTTGACTCACGGGGAATTCCAAGTCTCCACCCATTGACGTCATGGAGTTCGTTTGGTACCAA	
9E1	(407) GTTTTGGCACTACACCAATGGCGTGATAGCGTTTGACTCACGGGGAATTCCAAGTCTCCACCCATTGACGTCATGGAGTTCGTTTGGTACCAA	
9F11	(600) GTTTTGGCACTACATCAATGGCGTGATAGCGTTTGACTCACGGGGAATTCCAAGTCTCCACCCATTGACGTCATGGAGTTCGTTTGGTACCAA	
9G11	(600) GTTTTGGCACTACATCAATGGCGTGATAGCGTTTGACTCACGGGGAATTCCAAGTCTCCACCCATTGACGTCATGGAGTTCGTTTGGTACCAA	
9G12	(600) GTTTTGGCACTACATCAATGGCGTGATAGCGTTTGACTCACGGGGAATTCCAAGTCTCCACCCATTGACGTCATGGAGTTCGTTTGGTACCAA	
9G4	(600) GTTTTGGCACTACATCAATGGCGTGATAGCGTTTGACTCACGGGGAATTCCAAGTCTCCACCCATTGACGTCATGGAGTTCGTTTGGTACCAA	
9G7	(600) GTTTTGGCACTACATCAATGGCGTGATAGCGTTTGACTCACGGGGAATTCCAAGTCTCCACCCATTGACGTCATGGAGTTCGTTTGGTACCAA	
9G8	(600) GTTTTGGCACTACATCAATGGCGTGATAGCGTTTGACTCACGGGGAATTCCAAGTCTCCACCCATTGACGTCATGGAGTTCGTTTGGTACCAA	
AD169	(600) GTTTTGGCACTACATCAATGGCGTGATAGCGTTTGACTCACGGGGAATTCCAAGTCTCCACCCATTGACGTCATGGAGTTCGTTTGGTACCAA	
Towne	(600) GTTTTGGCACTACATCAATGGCGTGATAGCGTTTGACTCACGGGGAATTCCAAGTCTCCACCCATTGACGTCATGGAGTTCGTTTGGTACCAA	
Rhesus	(601) GTTTTGGCACTACATCAATGGCGTGATAGCGTTTGACTCACGGGGAATTCCAAGTCTCCACCCATTGACGTCATGGAGTTCGTTTGGTACCAA	800
10B2	(700) AATCAACGGGACTTCCAAAATGTCGTAATAACCCCGCCCGTTGACGCCAAATGGGCGTAGGGGTGTACGGTGGGAGGTCTATATAACAAATGTCGTT	
11E2	(700) AATCAACGGGACTTCCAAAATGTCGTAATAACCCCGCCCGTTGACGCCAAATGGGCGTAGGGGTGTACGGTGGGAGGTCTATATAACAAATGTCGTT	
12C9	(700) AATCAACGGGACTTCCAAAATGTCGTAATAACCCCGCCCGTTGACGCCAAATGGGCGTAGGGGTGTACGGTGGGAGGTCTATATAACAAATGTCGTT	
12E1	(683) ----- CGGTCTATGACGCCAAATGGGCGTAGGGGTGTACGGTGGGAGGTCTATATAACAAATGTCGTT	
12H9	(700) AATCAACGGGACTTCCAAAATGTCGTAATAACCCCGCCCGTTGACGCCAAATGGGCGTAGGGGTGTACGGTGGGAGGTCTATATAACAAATGTCGTT	
3C9	(701) AATCAACGGGACTTCCAAAATGTCGTAATAACCCCGCCCGTTGACGCCAAATGGGCGTAGGGGTGTACGGTGGGAGGTCTATATAACAAATGTCGTT	
4B5	(700) AATCAACGGGACTTCCAAAATGTCGTAATAACCCCGCCCGTTGACGCCAAATGGGCGTAGGGGTGTACGGTGGGAGGTCTATATAACAAATGTCGTT	
6A8	(703) AATCAACGGGACTTCCAAAATGTCGTAATAACCCCGCCCGTTGACGCCAAATGGGCGTAGGGGTGTACGGTGGGAGGTCTATATAACAAATGTCGTT	
6B2	(683) ----- CGGTCTATGACGCCAAATGGGCGTAGGGGTGTACGGTGGGAGGTCTATATAACAAATGTCGTT	
6D4	(683) ----- CGGTCTATGACGCCAAATGGGCGTAGGGGTGTACGGTGGGAGGTCTATATAACAAATGTCGTT	
6F6	(700) AATCAACGGGACTTCCAAAATGTCGTAATAACCCCGCCCGTTGACGCCAAATGGGCGTAGGGGTGTACGGTGGGAGGTCTATATAACAAATGTCGTT	
9E1	(507) AATCAACGGGACTTCCAAAATGTCGTAATAACCCCGCCCGTTGACGCCAAATGGGCGTAGGGGTGTACGGTGGGAGGTCTATATAACAAATGTCGTT	
9F11	(700) AATCAACGGGACTTCCAAAATGTCGTAATAACCCCGCCCGTTGACGCCAAATGGGCGTAGGGGTGTACGGTGGGAGGTCTATATAACAAATGTCGTT	
9G11	(700) AATCAACGGGACTTCCAAAATGTCGTAATAACCCCGCCCGTTGACGCCAAATGGGCGTAGGGGTGTACGGTGGGAGGTCTATATAACAAATGTCGTT	
9G12	(700) AATCAACGGGACTTCCAAAATGTCGTAATAACCCCGCCCGTTGACGCCAAATGGGCGTAGGGGTGTACGGTGGGAGGTCTATATAACAAATGTCGTT	
9G4	(702) AATCAACGGGACTTCCAAAATGTCGTAATAACCCCGCCCGTTGACGCCAAATGGGCGTAGGGGTGTACGGTGGGAGGTCTATATAACAAATGTCGTT	
9G7	(700) AATCAACGGGACTTCCAAAATGTCGTAATAACCCCGCCCGTTGACGCCAAATGGGCGTAGGGGTGTACGGTGGGAGGTCTATATAACAAATGTCGTT	
9G8	(700) AATCAACGGGACTTCCAAAATGTCGTAATAACCCCGCCCGTTGACGCCAAATGGGCGTAGGGGTGTACGGTGGGAGGTCTATATAACAAATGTCGTT	
AD169	(700) AATCAACGGGACTTCCAAAATGTCGTAATAACCCCGCCCGTTGACGCCAAATGGGCGTAGGGGTGTACGGTGGGAGGTCTATATAACAAATGTCGTT	
Towne	(700) AATCAACGGGACTTCCAAAATGTCGTAATAACCCCGCCCGTTGACGCCAAATGGGCGTAGGGGTGTACGGTGGGAGGTCTATATAACAAATGTCGTT	
Rhesus	(701) AATCAACGGGACTTCCAAAATGTCGTAATAACCCCGCCCGTTGACGCCAAATGGGCGTAGGGGTGTACGGTGGGAGGTCTATATAACAAATGTCGTT	

Figure 8E: Comparison of 18 chimeric promoter sequences generated by DNA shuffling using CMV promoter nucleic acid sequences from AD169 and Towne human strains and Rhesus and Vervet monkey strains as parental sequences.

10B2	(800)	TAGTGAACCGTCAGATCGCCTGGAGACGCCATCCACGCTGTTTGGACCTCCAT-AGAAGACACCGGGACCGATCCAGCCTCCGCGCCGGGAAACGTTGCA	900
11E2	(800)	TAGGAACCGCATTTGCTTGGGGACG- - - - - CGGAG- - - - - GAGCTCCATTTGAAGAGACCGGGACCGATCCAGCCTCCGCGCCGGGAAACGTTGCA	
12C9	(800)	TAGGAACCGCATTTGCTTGGGGACG- - - - - CGGAG- - - - - GAGCACCAT-AGAAGACACCGGGACCGATCCAGCCTCCGCGCCGGGAAACGTTGCA	
12E1	(748)	TAGTGAACCGTCAGATCGCCTGGAGACGCCATCCACGCTGTTTGGACCTCCAT-AGAAGACACCGGGACCGATCCAGCCTCCGCGCCGGGAAACGTTGCA	
12H9	(800)	TAGTGAACCGTCAGATCGCCTGGAGACGCCATCCACGCTGTTTGGACCTCCAT-AGAAGACACCGGGACCGATCCAGCCTCCGCGCCGGGAAACGTTGCA	
3C9	(801)	TAGTGAACCGTCAGATCGCCTGGAGACGCCATCCACGCTGTTTGGACCTCCAT-AGAAGACACCGGGACCGATCCAGCCTCCGCGCCGGGAAACGTTGCA	
4B5	(748)	TAGTGAACCGTCAGATCGCCTGGAGACGCCATCCACGCTGTTTGGACCTCCAT-AGAAGACACCGGGACCGATCCAGCCTCCGCGCCGGGAAACGTTGCA	
6A8	(800)	TAGTGAACCGTCAGATCGCCTGGAGACGCCATCCACGCTGTTTGGACCTCCAT-AGAAGACACCGGGACCGATCCAGCCTCCGCGCCGGGAAACGTTGCA	
6B2	(748)	TAGTGAACCGTCAGATCGCCTGGAGACGCCATCCACGCTGTTTGGACCTCCAT-AGAAGACACCGGGACCGATCCAGCCTCCGCGCCGGGAAACGTTGCA	
6D4	(748)	TAGTGAACCGTCAGATCGCCTGGAGACGCCATCCACGCTGTTTGGACCTCCAT-AGAAGACACCGGGACCGATCCAGCCTCCGCGCCGGGAAACGTTGCA	
6F6	(800)	TAGTGAACCGTCAGATCGCCTGGAGACGCCATCCACGCTGTTTGGACCTCCAT-AGAAGACACCGGGACCGATCCAGCCTCCGCGCCGGGAAACGTTGCA	
9E1	(607)	TAGTGAACCGTCAGATCGCCTGGAGACGCCATCCACGCTGTTTGGACCTCCAT-AGAAGACACCGGGACCGATCCAGCCTCCGCGCCGGGAAACGTTGCA	
9F11	(799)	TAGTGAACCGTCAGATCGCCTGGAGACGCCATCCACGCTGTTTGGACCTCCAT-AGAAGACACCGGGACCGATCCAGCCTCCGCGCCGGGAAACGTTGCA	
9G11	(800)	TAGTGAACCGTCAGATCGCCTGGAGACGCCATCCACGCTGTTTGGACCTCCAT-AGAAGACACCGGGACCGATCCAGCCTCCGCGCCGGGAAACGTTGCA	
9G12	(800)	TAGTGAACCGTCAGATCGCCTGGAGACGCCATCCACGCTGTTTGGACCTCCAT-AGAAGACACCGGGACCGATCCAGCCTCCGCGCCGGGAAACGTTGCA	
9G4	(800)	TAGTGAACCGTCAGATCGCCTGGAGACGCCATCCACGCTGTTTGGACCTCCAT-AGAAGACACCGGGACCGATCCAGCCTCCGCGCCGGGAAACGTTGCA	
9G7	(800)	TAGTGAACCGTCAGATCGCCTGGAGACGCCATCCACGCTGTTTGGACCTCCAT-AGAAGACACCGGGACCGATCCAGCCTCCGCGCCGGGAAACGTTGCA	
9G8	(800)	TAGTGAACCGTCAGATCGCCTGGAGACGCCATCCACGCTGTTTGGACCTCCAT-AGAAGACACCGGGACCGATCCAGCCTCCGCGCCGGGAAACGTTGCA	
AD169	(799)	TAGTGAACCGTCAGATCGCCTGGAGACGCCATCCACGCTGTTTGGACCTCCAT-AGAAGACACCGGGACCGATCCAGCCTCCGCGCCGGGAAACGTTGCA	
Towne	(800)	TAGTGAACCGTCAGATCGCCTGGAGACGCCATCCACGCTGTTTGGACCTCCAT-AGAAGACACCGGGACCGATCCAGCCTCCGCGCCGGGAAACGTTGCA	
consensus	(801)	TAGTGAACCGTCAGATCGCCTGGAGACGCCATCCACGCTGTTTGGACCTCCAT-AGAAGACACCGGGACCGATCCAGCCTCCGCGCCGGGAAACGTTGCA	901
10B2	(899)	TTGGAACGCGGATTCCCGGTGCCAAGAGTACGTAAGTACCGCTATAGACTCTATAGGCACACCCCTTTGGCT-CTTATGCATGCTATACCTGTTTTTGG	1000
11E2	(890)	TTGGAACGCGGATTCCCGGTGCCAAGAGTACGTAAGTACCGCTATAGACTCTATAGGCACACCCCTTTGGCT-CTTATGCATGCTATACCTGTTTTTGG	
12C9	(889)	TTGGAACGCG- - - - -	
12E1	(847)	TTGGAACGCGGATTCCCGGTGCCAAGAGTACGTAAGTACCGCTATAGACTCTATAGGCACACCCCTTTGGCT-CTTATGCATGCTATACCTGTTTTTGG	
12H9	(899)	TTGGAACGCGGATTCCCGGTGCCAAGAGTACGTAAGTACCGCTATAGACTCTATAGGCACACCCCTTTGGCT-CTTATGCATGCTATACCTGTTTTTGG	
3C9	(900)	TTGGAACGCGGATTCCCGGTGCCAAGAGTACGTAAGTACCGCTATAGACTCTATAGGCACACCCCTTTGGCT-CTTATGCATGCTATACCTGTTTTTGG	
4B5	(847)	TTGGAACGCGGATTCCCGGTGCCAAGAGTACGTAAGTACCGCTATAGACTCTATAGGCACACCCCTTTGGCT-CTTATGCATGCTATACCTGTTTTTGG	
6A8	(899)	TTGGAACGCGGATTCCCGGTGCCAAGAGTACGTAAGTACCGCTATAGACTCTATAGGCACACCCCTTTGGCT-CTTATGCATGCTATACCTGTTTTTGG	
6B2	(847)	TTGGAACGCGGATTCCCGGTGCCAAGAGTACGTAAGTACCGCTATAGACTCTATAGGCACACCCCTTTGGCT-CTTATGCATGCTATACCTGTTTTTGG	
6D4	(847)	TTGGAACGCGGATTCCCGGTGCCAAGAGTACGTAAGTACCGCTATAGACTCTATAGGCACACCCCTTTGGCT-CTTATGCATGCTATACCTGTTTTTGG	
6F6	(889)	TTGGAACGCGGATTCCCGGTGCCAAGAGTACGTAAGTACCGCTATAGACTCTATAGGCACACCCCTTTGGCT-CTTATGCATGCTATACCTGTTTTTGG	
9E1	(706)	TTGGAACGCGGATTCCCGGTGCCAAGAGTACGTAAGTACCGCTATAGACTCTATAGGCACACCCCTTTGGCT-CTTATGCATGCTATACCTGTTTTTGG	
9F11	(898)	TTGGAACGCGGATTCCCGGTGCCAAGAGTACGTAAGTACCGCTATAGACTCTATAGGCACACCCCTTTGGCT-CTTATGCATGCTATACCTGTTTTTGG	
9G11	(899)	TTGGAACGCGGATTCCCGGTGCCAAGAGTACGTAAGTACCGCTATAGACTCTATAGGCACACCCCTTTGGCT-CTTATGCATGCTATACCTGTTTTTGG	
9G12	(899)	TTGGAACGCGGATTCCCGGTGCCAAGAGTACGTAAGTACCGCTATAGACTCTATAGGCACACCCCTTTGGCT-CTTATGCATGCTATACCTGTTTTTGG	
9G4	(899)	TTGGAACGCGGATTCCCGGTGCCAAGAGTACGTAAGTACCGCTATAGACTCTATAGGCACACCCCTTTGGCT-CTTATGCATGCTATACCTGTTTTTGG	
9G7	(889)	TTGGAACGCGGATTCCCGGTGCCAAGAGTACGTAAGTACCGCTATAGACTCTATAGGCACACCCCTTTGGCT-CTTATGCATGCTATACCTGTTTTTGG	
9G8	(899)	TTGGAACGCGGATTCCCGGTGCCAAGAGTACGTAAGTACCGCTATAGACTCTATAGGCACACCCCTTTGGCT-CTTATGCATGCTATACCTGTTTTTGG	
AD169	(898)	TTGGAACGCGGATTCCCGGTGCCAAGAGTACGTAAGTACCGCTATAGACTCTATAGGCACACCCCTTTGGCT-CTTATGCATGCTATACCTGTTTTTGG	
Towne	(899)	TTGGAACGCGGATTCCCGGTGCCAAGAGTACGTAAGTACCGCTATAGACTCTATAGGCACACCCCTTTGGCT-CTTATGCATGCTATACCTGTTTTTGG	
consensus	(901)	TTGGAACGCGGATTCCCGGTGCCAAGAGTACGTAAGTACCGCTATAGACTCTATAGGCACACCCCTTTGGCT-CTTATGCATGCTATACCTGTTTTTGG	

1001

[illegible]

[illegible]

Figure 8H: Comparison of 18 chimeric promoter sequences generated by DNA shuffling using CMV promoter nucleic acid sequences from AD169 and Towne human strains and Rhesus and Vervet monkey strains as parental sequences.

10B2	1398	TCATGGTCGTCGGCAGCTCCTTGCTCCTAACAGTGGAGGCCAGACTTAGGCACAGCACAATGCCACCACCAACCACTGTGCCGCAAAAGGCCCTTGGCGG	1500
11E2	1389	TCATGGTCGTCGGCAGCTCCTTGCTCCTAACAGTGGAGGCCAGACTTAGGCACAGCACAATGCCACCACCACTGTGCCGCAAAAGGCCCTTGGCGG	
12C9	898	-----	
12E1	1347	TCATGGTCGTCGGCAGCTCCTTGCTCCTAACAGTGGAGGCCAGACTTAGGCACAGCACAATGCCACCACCAACCACTGTGCCGCAAAAGGCCCTTGGCGG	
12H9	1398	TCATGGTCGTCGGCAGCTCCTTGCTCCTAACAGTGGAGGCCAGACTTAGGCACAGCACAATGCCACCACCACTGTGCCGCAAAAGGCCCTTGGCGG	
3C9	1399	TCATGGTCGTCGGCAGCTCCTTGCTCCTAACAGTGGAGGCCAGACTTAGGCACAGCACAATGCCACCACCACTGTGCCGCAAAAGGCCCTTGGCGG	
4B5	1346	TCATGGTCGTCGGCAGCTCCTTGCTCCTAACAGTGGAGGCCAGACTTAGGCACAGCACAATGCCACCACCACTGTGCCGCAAAAGGCCCTTGGCGG	
6A8	1398	TCATGGTCGTCGGCAGCTCCTTGCTCCTAACAGTGGAGGCCAGACTTAGGCACAGCACAATGCCACCACCACTGTGCCGCAAAAGGCCCTTGGCGG	
6E2	1346	TCATGGTCGTCGGCAGCTCCTTGCTCCTAACAGTGGAGGCCAGACTTAGGCACAGCACAATGCCACCACCACTGTGCCGCAAAAGGCCCTTGGCGG	
6D4	1346	TCATGGTCGTCGGCAGCTCCTTGCTCCTAACAGTGGAGGCCAGACTTAGGCACAGCACAATGCCACCACCACTGTGCCGCAAAAGGCCCTTGGCGG	
6F6	1388	TCATGGTCGTCGGCAGCTCCTTGCTCCTAACAGTGGAGGCCAGACTTAGGCACAGCACAATGCCACCACCACTGTGCCGCAAAAGGCCCTTGGCGG	
9E1	1205	TCATGGTCGTCGGCAGCTCCTTGCTCCTAACAGTGGAGGCCAGACTTAGGCACAGCACAATGCCACCACCACTGTGCCGCAAAAGGCCCTTGGCGG	
9F11	1396	TCATGGTCGTCGGCAGCTCCTTGCTCCTAACAGTGGAGGCCAGACTTAGGCACAGCACAATGCCACCACCACTGTGCCGCAAAAGGCCCTTGGCGG	
9G11	1398	TCATGGTCGTCGGCAGCTCCTTGCTCCTAACAGTGGAGGCCAGACTTAGGCACAGCACAATGCCACCACCACTGTGCCGCAAAAGGCCCTTGGCGG	
9G12	1398	TCATGGTCGTCGGCAGCTCCTTGCTCCTAACAGTGGAGGCCAGACTTAGGCACAGCACAATGCCACCACCACTGTGCCGCAAAAGGCCCTTGGCGG	
9G4	1398	TCATGGTCGTCGGCAGCTCCTTGCTCCTAACAGTGGAGGCCAGACTTAGGCACAGCACAATGCCACCACCACTGTGCCGCAAAAGGCCCTTGGCGG	
9G8	1388	TCATGGTCGTCGGCAGCTCCTTGCTCCTAACAGTGGAGGCCAGACTTAGGCACAGCACAATGCCACCACCACTGTGCCGCAAAAGGCCCTTGGCGG	
AD169	1398	TCATGGTCGTCGGCAGCTCCTTGCTCCTAACAGTGGAGGCCAGACTTAGGCACAGCACAATGCCACCACCACTGTGCCGCAAAAGGCCCTTGGCGG	
Towne	1397	TCATGGTCGTCGGCAGCTCCTTGCTCCTAACAGTGGAGGCCAGACTTAGGCACAGCACAATGCCACCACCACTGTGCCGCAAAAGGCCCTTGGCGG	
nsensus	1401	TCATGGTCGTCGGCAGCTCCTTGCTCCTAACAGTGGAGGCCAGACTTAGGCACAGCACAATGCCACCACCACTGTGCCGCAAAAGGCCCTTGGCGG	
10B2	1498	TAGGGTATGTGCTGAAAAATGAGCTCGAGATTGGGCTCGCACCGCTGACGAGATGGAAGACTTAAGGCAGCGGCAGAAAGATGCGAGGACGCTGAGT	1600
11E2	1489	TAGGGTATGTGCTGAAAAATGAGCTCGAGATTGGGCTCGCACCGCTGACGAGATGGAAGACTTAAGGCAGCGGCAGAAAGATGCGAGGACGCTGAGT	
12C9	898	-----	
12E1	1447	TAGGGTATGTGCTGAAAAATGAGCTCGAGATTGGGCTCGCACCGCTGACGAGATGGAAGACTTAAGGCAGCGGCAGAAAGATGCGAGGACGCTGAGT	
12H9	1498	TAGGGTATGTGCTGAAAAATGAGCTCGAGATTGGGCTCGCACCGCTGACGAGATGGAAGACTTAAGGCAGCGGCAGAAAGATGCGAGGACGCTGAGT	
3C9	1499	TAGGGTATGTGCTGAAAAATGAGCTCGG--AGTGGGCTTGACCCGCTGACCGCTGACGAGATGGAAGACTTAAGGCAGCGGCAGAAAGATGCGAGGACGCTGAGT	
4B5	1446	TAGGGTATGTGCTGAAAAATGAGCTCGAGATTGGGCTCGCACCCGCTGACCGCTGACGAGATGGAAGACTTAAGGCAGCGGCAGAAAGATGCGAGGACGCTGAGT	
6A8	1498	TAGGGTATGTGCTGAAAAATGAGCTCGAGATTGGGCTCGCACCCGCTGACCGCTGACGAGATGGAAGACTTAAGGCAGCGGCAGAGAAAGATGCGAGGACGCTGAGT	
6B2	1446	TAGGGTATGTGCTGAAAAATGAGCTCGAGATTGGGCTCGCACCCGCTGACCGCTGACGAGATGGAAGACTTAAGGCAGCGGCAGAGAAAGATGCGAGGACGCTGAGT	
6D4	1446	TAGGGTATGTGCTGAAAAATGAGCTCGAGATTGGGCTCGCACCCGCTGACCGCTGACGAGATGGAAGACTTAAGGCAGCGGCAGAGAAAGATGCGAGGACGCTGAGT	
6F6	1488	TAGGGTATGTGCTGAAAAATGAGCTCGAGATTGGGCTCGCACCCGCTGACCGCTGACGAGATGGAAGACTTAAGGCAGCGGCAGAGAAAGATGCGAGGACGCTGAGT	
9E1	1305	TAGGGTATGTGCTGAAAAATGAGCTCGAGATTGGGCTCGCACCCGCTGACCGCTGACGAGATGGAAGACTTAAGGCAGCGGCAGAGAAAGATGCGAGGACGCTGAGT	
9F11	1496	TAGGGTATGTGCTGAAAAATGAGCTCGAGATTGGGCTCGCACCCGCTGACCGCTGACGAGATGGAAGACTTAAGGCAGCGGCAGAGAAAGATGCGAGGACGCTGAGT	
9G11	1498	TAGGGTATGTGCTGAAAAATGAGCTCGAGATTGGGCTCGCACCCGCTGACCGCTGACGAGATGGAAGACTTAAGGCAGCGGCAGAGAAAGATGCGAGGACGCTGAGT	
9G12	1498	TAGGGTATGTGCTGAAAAATGAGCTCGAGATTGGGCTCGCACCCGCTGACCGCTGACGAGATGGAAGACTTAAGGCAGCGGCAGAGAAAGATGCGAGGACGCTGAGT	
9G4	1498	TAGGGTATGTGCTGAAAAATGAGCTCGAGATTGGGCTCGCACCCGCTGACCGCTGACGAGATGGAAGACTTAAGGCAGCGGCAGAGAAAGATGCGAGGACGCTGAGT	
9G8	1488	TAGGGTATGTGCTGAAAAATGAGCTCGAGATTGGGCTCGCACCCGCTGACCGCTGACGAGATGGAAGACTTAAGGCAGCGGCAGAGAAAGATGCGAGGACGCTGAGT	
AD169	1498	TAGGGTATGTGCTGAAAAATGAGCTCGAGATTGGGCTCGCACCCGCTGACCGCTGACGAGATGGAAGACTTAAGGCAGCGGCAGAGAAAGATGCGAGGACGCTGAGT	
Towne	1497	TAGGGTATGTGCTGAAAAATGAGCTCGAGATTGGGCTCGCACCCG--TGACGAGATGGAAGACTTAAGGCAGCGGCAGAGAAAGATGCGAGGACGCTGAGT	
nsensus	1501	TAGGGTATGTGCTGAAAAATGAGCTCGAGATTGGGCTCGCACCCGCTGACGAGATGGAAGACTTAAGGCAGCGGCAGAGAAAGATGCGAGGACGCTGAGT	

Figure 81: Comparison of 18 chimeric promoter sequences generated by DNA shuffling using CMV promoter nucleic acid sequences from AD169 and Towne human strains and Rhesus and Vervet monkey strains as parental sequences.

		1601				1700
10B2	(1598)	TGTTGATTTCTGATAAAGAGTCAGAGGTAACCTCCCGTTGCGGTGCTGTTAAACGGTGGAGGGCAGTGTAGTCTGAGCAGTACTCGTTGCTGCCGCGCGGCC				
11E2	(1589)	TGTTGATTTCTGATAAAGAGTCAGAGGTAACCTCCCGTTGCGGTGCTGTTAAACGGTGGAGGGCAGTGTAGTCTGAGCAGTACTCGTTGCTGCCGCGCGGCC				
12C9	(898)	-----				
12E1	(1547)	TGTTGATTTCTGATAAAGAGTCAGAGGTAACCTCCCGTTGCGGTGCTGTTAAACGGTGGAGGGCAGTGTAGTCTGAGCAGTACTCGTTGCTGCCGCGCGGCC				
12H9	(1598)	TGTTGATTTCTGATAAAGAGTCAGAGGTAACCTCCCGTTGCGGTGCTGTTAAACGGTGGAGGGCAGTGTAGTCTGAGCAGTACTCGTTGCTGCCGCGCGGCC				
3C9	(1597)	TGTTGATTTCTGATAAAGAGTCAGAGGTAACCTCCCGTTGCGGTGCTGTTAAACGGTGGAGGGCAGTGTAGTCTGAGCAGTACTCGTTGCTGCCGCGCGGCC				
4B5	(1546)	TGTTGATTTCTGATAAAGAGTCAGAGGTAACCTCCCGTTGCGGTGCTGTTAAACGGTGGAGGGCAGTGTAGTCTGAGCAGTACTCGTTGCTGCCGCGCGGCC				
6A8	(1598)	TGTTGATTTCTGATAAAGAGTCAGAGGTAACCTCCCGTTGCGGTGCTGTTAAACGGTGGAGGGCAGTGTAGTCTGAGCAGTACTCGTTGCTGCCGCGCGGCC				
6B2	(1546)	TGTTGATTTCTGATAAAGAGTCAGAGGTAACCTCCCGTTGCGGTGCTGTTAAACGGTGGAGGGCAGTGTAGTCTGAGCAGTACTCGTTGCTGCCGCGCGGCC				
6D4	(1546)	TGTTGATTTCTGATAAAGAGTCAGAGGTAACCTCCCGTTGCGGTGCTGTTAAACGGTGGAGGGCAGTGTAGTCTGAGCAGTACTCGTTGCTGCCGCGCGGCC				
6F6	(1588)	TGTTGATTTCTGATAAAGAGTCAGAGGTAACCTCCCGTTGCGGTGCTGTTAAACGGTGGAGGGCAGTGTAGTCTGAGCAGTACTCGTTGCTGCCGCGCGGCC				
9E1	(1405)	TGTTGATTTCTGATAAAGAGTCAGAGGTAACCTCCCGTTGCGGTGCTGTTAAACGGTGGAGGGCAGTGTAGTCTGAGCAGTACTCGTTGCTGCCGCGCGGCC				
9F11	(1596)	TGTTGATTTCTGATAAAGAGTCAGAGGTAACCTCCCGTTGCGGTGCTGTTAAACGGTGGAGGGCAGTGTAGTCTGAGCAGTACTCGTTGCTGCCGCGCGGCC				
9G11	(1598)	TGTTGATTTCTGATAAAGAGTCAGAGGTAACCTCCCGTTGCGGTGCTGTTAAACGGTGGAGGGCAGTGTAGTCTGAGCAGTACTCGTTGCTGCCGCGCGGCC				
9G12	(1598)	TGTTGATTTCTGATAAAGAGTCAGAGGTAACCTCCCGTTGCGGTGCTGTTAAACGGTGGAGGGCAGTGTAGTCTGAGCAGTACTCGTTGCTGCCGCGCGGCC				
9G4	(1598)	TGTTGATTTCTGATAAAGAGTCAGAGGTAACCTCCCGTTGCGGTGCTGTTAAACGGTGGAGGGCAGTGTAGTCTGAGCAGTACTCGTTGCTGCCGCGCGGCC				
9G7	(1588)	TGTTGATTTCTGATAAAGAGTCAGAGGTAACCTCCCGTTGCGGTGCTGTTAAACGGTGGAGGGCAGTGTAGTCTGAGCAGTACTCGTTGCTGCCGCGCGGCC				
9G8	(1598)	TGTTGATTTCTGATAAAGAGTCAGAGGTAACCTCCCGTTGCGGTGCTGTTAAACGGTGGAGGGCAGTGTAGTCTGAGCAGTACTCGTTGCTGCCGCGCGGCC				
AD169	(1598)	TGTTGATTTCTGATAAAGAGTCAGAGGTAACCTCCCGTTGCGGTGCTGTTAAACGGTGGAGGGCAGTGTAGTCTGAGCAGTACTCGTTGCTGCCGCGCGGCC				
Towne	(1596)	TGTTGATTTCTGATAAAGAGTCAGAGGTAACCTCCCGTTGCGGTGCTGTTAAACGGTGGAGGGCAGTGTAGTCTGAGCAGTACTCGTTGCTGCCGCGCGGCC				
onsensus	(1601)	TGTTGATTTCTGATAAAGAGTCAGAGGTAACCTCCCGTTGCGGTGCTGTTAAACGGTGGAGGGCAGTGTAGTCTGAGCAGTACTCGTTGCTGCCGCGCGGCC				
		1701				1770
10B2	(1698)	ACCAGACATAATAGCTGACAGACTAACAGACTGTTCTTCCATGGGTCTTTTCTGCACTCACCGTCCTT				
11E2	(1689)	ACCAGACATAATAGCTGACAGACTAACAGACTGTTCTTCCATGGGTCTTTTCTGCACTCACCGTCCTT				
12C9	(898)	-----				
12E1	(1647)	ACCAGACATAATAGCTGACAGACTAACAGACTGTTCTTCCATGGGTCTTTTCTGCACTCACCGTCCTT				
12H9	(1698)	ACCAGACATAATAGCTGACAGACTAACAGACTGTTCTTCCATGGGTCTTTTCTGCACTCACCGTCCTT				
3C9	(1697)	ACCAGACATAATAGCTGACAGACTAACAGACTGTTCTTCCATGGGTCTTTTCTGCACTCACCGTCCTT				
4B5	(1646)	ACCAGACATAATAGCTGACAGACTAACAGACTGTTCTTCCATGGGTCTTTTCTGCACTCACCGTCCTT				
6A8	(1698)	ACCAGACATAATAGCTGACAGACTAACAGACTGTTCTTCCATGGGTCTTTTCTGCACTCACCGTCCTT				
6B2	(1646)	ACCAGACATAATAGCTGACAGACTAACAGACTGTTCTTCCATGGGTCTTTTCTGCACTCACCGTCCTT				
6D4	(1646)	ACCAGACATAATAGCTGACAGACTAACAGACTGTTCTTCCATGGGTCTTTTCTGCACTCACCGTCCTT				
6F6	(1688)	ACCAGACATAATAGCTGACAGACTAACAGACTGTTCTTCCATGGGTCTTTTCTGCACTCACCGTCCTT				
9E1	(1505)	ACCAGACATAATAGCTGACAGACTAACAGACTGTTCTTCCATGGGTCTTTTCTGCACTCACCGTCCTT				
9F11	(1696)	ACCAGACATAATAGCTGACAGACTAACAGACTGTTCTTCCATGGGTCTTTTCTGCACTCACCGTCCTT				
9G11	(1698)	ACCAGACATAATAGCTGACAGACTAACAGACTGTTCTTCCATGGGTCTTTTCTGCACTCACCGTCCTT				
9G12	(1698)	ACCAGACATAATAGCTGACAGACTAACAGACTGTTCTTCCATGGGTCTTTTCTGCACTCACCGTCCTT				
9G4	(1698)	ACCAGACATAATAGCTGACAGACTAACAGACTGTTCTTCCATGGGTCTTTTCTGCACTCACCGTCCTT				
9G7	(1688)	ACCAGACATAATAGCTGACAGACTAACAGACTGTTCTTCCATGGGTCTTTTCTGCACTCACCGTCCTT				
9G8	(1698)	ACCAGACATAATAGCTGACAGACTAACAGACTGTTCTTCCATGGGTCTTTTCTGCACTCACCGTCCTT				
AD169	(1698)	ACCAGACATAATAGCTGACAGACTAACAGACTGTTCTTCCATGGGTCTTTTCTGCACTCACCGTCCTT				
Towne	(1696)	ACCAGACATAATAGCTGACAGACTAACAGACTGTTCTTCCATGGGTCTTTTCTGCACTCACCGTCCTT				
onsensus	(1701)	ACCAGACATAATAGCTGACAGACTAACAGACTGTTCTTCCATGGGTCTTTTCTGCACTCACCGTCCTT				

18/23

Vector for promoter evolution

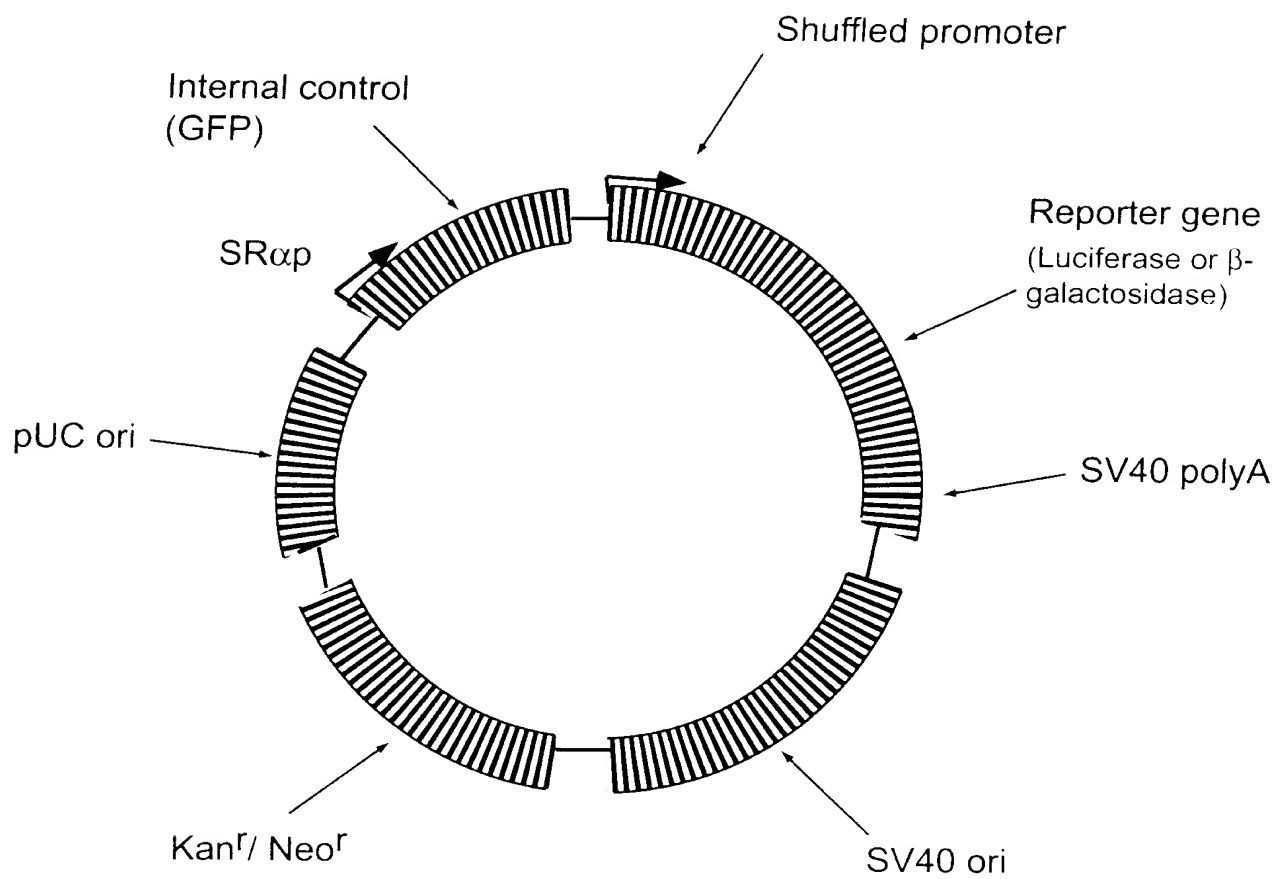


Fig. 9

Figure 10A

Towne_promoter_fr_PCR_prod_seq	1	ATA.....TGAGGCTATATCGCCGATAGAGCGGACATCAAGCTGGCACATGGCCAATGCAT	60
Rhesus_monkey_PCR_prod_821bp		ACT.....TGGCACGGTGCCAA.GTTTGGGGCGGGTC...TTGGCACCGTGCCAA.....	
Vervet_(Simian)_PCR_product_seq		ATTGAATTGGCATGGTGCCCAATAATGGCGGC..CATA...TTGGCTATATGCCA.....	
	61		
Towne_promoter_fr_PCR_prod_seq	120	ATCGATCTATACATTGAATCAATATTGGCAATTAGCCATATTAGTCATTGGTTATATAGC	120
Rhesus_monkey_PCR_prod_821bp		...GTCCGCCCATATTGGTTGGCAT.....ATGTCCAATATTATTGAT...CCATATAGC	
Vervet_(Simian)_PCR_product_seq	GGATCAATAT.....ATAGGCAATATC.....CAATTTGGC	
	121		
Towne_promoter_fr_PCR_prod_seq	180	ATAAATCAATATTGGCTATTGGCCATTGCATACGTTGTATCTATATCATATAATGTACAT	180
Rhesus_monkey_PCR_prod_821bp		CAATATCCAATATGGCTAATAGCCA.....GGTTCAATAGAAATGGCCAATAAGC	
Vervet_(Simian)_PCR_product_seq		CCTATGCCCAATATGGCTATTGGCCA.....GGTTCAATACTATGTATTGGCCCT	
	181		
Towne_promoter_fr_PCR_prod_seq	240	TTATATTGGCTCATGTCCAATATGACCGCCATGTTGACATTGATTATCACTAGTT...AT	240
Rhesus_monkey_PCR_prod_821bp		CAATAT..GCCATTGGCCCAACATGGCAA.TGGGCCAGTATTGATTATAGCCAATAT...AT	
Vervet_(Simian)_PCR_product_seq		ATGCCA..TATAGTATCCCATATATGGGTTTCCTATTGACGTAGATAGCCCTCCCAAT	

Figure 10B

Towne_promoter_fr_PCR_prod_seq	241	TAATAGTA.....ATCAATTACGGGGTCATTAGTTCATAGCCCATATATGGAGTTCCGC	300
Rhesus_monkey_PCR_prod_821bp		AGGCAATA.....ATCCATATTGG...CATATGTCCATATTGCCATAGCCCATATTGGC	
Vervet_(Simian)_PCR_product_seq		GGGCGGTCCCATATACCATATATGG...GGCTTCCTAATACCGCCCATAGCCACTCCCCC	
Towne_promoter_fr_PCR_prod_seq	301	GT...T..ACATAACTTACGGTAAATGGCCCGCCTCGTGACCGCCCAACGACCCCCGCCC	360
Rhesus_monkey_PCR_prod_821bp		TTATGT..CCATTACCAATACCATATATGGGTCTTCCCTATATACGTACATAGGTACCGCCC	
Vervet_(Simian)_PCR_product_seq		AT...TGACGTCAATGGTCTCTATATATGGTCTTTCCTATTGACGTCAATATGGCGGTCC	
Towne_promoter_fr_PCR_prod_seq	361	.ATTGACGT.....	420
Rhesus_monkey_PCR_prod_821bp		.ATTGACGTAAATATGGATACGCCTCCATTGACGTCAATGGAGGGATTAAATATACGTCAC	CAA
Vervet_(Simian)_PCR_product_seq		TATTGACGTA.TATGGCGCCTCCCCCATTGACGTCAATTACGGTAAATGGCCCGCCTGGC	
Towne_promoter_fr_PCR_prod_seq	421	TAATGACGTATGTTCCCAT.....	480
Rhesus_monkey_PCR_prod_821bp		TAATACCGCCCATTGACGTGTATAGGACCGTCCCATTTGACGTCAATAGGCCCACTCCCA	
Vervet_(Simian)_PCR_product_seq		T..CAATGCCCCATTGACGT.....CAATAGGACCACCCACCA	

Figure 10C

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481      Towne_promoter_fr_PCR_prod_seq      540
      Rhesus_monkey_PCR_prod_821bp      TTAGCGTCAATGGGTGGAGTATTACGGTAAACTGCCCACTT.....GGCAGTAC
      Vervet_(Simian)_PCR_product_seq      TTAGCGTCAATGGG.....GTGGCCCATTTGCCCATTC.....
      ATGGCTCATTTGCCCATTCATATCCGTTC.....

541      Towne_promoter_fr_PCR_prod_seq      600
      Rhesus_monkey_PCR_prod_821bp      ATCAAGTGTATCATATGCCAAGTCGGCCCCCTATTGACGTCAATGACGGTAAATGGCCC
      Vervet_(Simian)_PCR_product_seq      .....CCACGCCCCCTATTGACGTCAATGACGGTAAATGGCC.
      TCACGCCCCCTATTGACGTCAATGACGGTAAATGGCC.

601      Towne_promoter_fr_PCR_prod_seq      660
      Rhesus_monkey_PCR_prod_821bp      GCCTGGCATTATGCCCCAGTACATGACCTTAGCGGACTTTCCTACTTGGCAGTACATC..T
      Vervet_(Simian)_PCR_product_seq      .....CACTTGGCAGTACATCAAT
      .....CACTTGGCAGTACATCAAT

661      Towne_promoter_fr_PCR_prod_seq      720
      Rhesus_monkey_PCR_prod_821bp      ACGTATTAGTCATCGCTATTACCATGGTGATCGGGTTTGGCAGTACACCAA.....
      Vervet_(Simian)_PCR_product_seq      ACCTATTAATAGTAACT..TGGCAAGTAAATGGGTACTTGGCAGTACACCAAGG.TACAT
      ATCTATTAATAGTAACT..TGGCAAGTACATTACTATTGGCAAGTACGCCAAGGGGTACAT

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Figure 10D

Towne_promoter_fr_PCR_prod_seq	721TGGGCGTGGATAGCGGT..TTGACTCACGGGGATTTCCAAAGTCTC	780
Rhesus_monkey_PCR_prod_821bp		TGGCAG.TACTCCCATTGACGTCAATGGCGGTAAATGGCCCGCAATGGCTGCCAAGTACA	
Vervet_(Simian)_PCR_product_seq		TGGCAGGTACTCCCATTTGACGTCAATGGCGGTAAATGGCCCGCATGGCTGCCAAGTACA	
Towne_promoter_fr_PCR_prod_seq	781	...CACCCCATTGACGTCAATGGGAGTTTGTTTTGGCACCACCAAAATCAACGGGACTTTCCA	840
Rhesus_monkey_PCR_prod_821bp		...TGCCC.ATTGACGTCAATGGGG.....	
Vervet_(Simian)_PCR_product_seq		ACATCCCC.ATTGACGTCAATGGGAA.....	
Towne_promoter_fr_PCR_prod_seq	841	AAATGTCGTAATAACCCCGCCCCCGTTGACGCACAAATGGGCG.....	900
Rhesus_monkey_PCR_prod_821bp	CGGTCTTATGACGTCAATGGGCG.....	
Vervet_(Simian)_PCR_product_seq	GGGGCAATGACGCACAAATGGGCGTTCCATTGACGTAAATGGCG	
Towne_promoter_fr_PCR_prod_seq	901	GTAGGCGGTACGGTGGGAGGTCTATATAAGCAGAGCTCGTTTAGTGAACCGTCAGATCG	960
Rhesus_monkey_PCR_prod_821bp		GTAGGCGTGC.CTATGGGCGGTCTATATAAGCAATGCACGTTTAGGGAACCGCCATTCTG	
Vervet_(Simian)_PCR_product_seq		GTAGGCGTGCCTAATGGGAGGTCTATATAAGCAATGCTCGTTTAGGGAACCGCCATTCTG	

Figure 10E

Towne_promoter_fr_PCR_prod_seq	961	CCTGGAGACGCCATCCAGCTGTTTGA	1020
Rhesus_monkey_PCR_prod_821bp		CCTGGGACGTCG.....GAGGAGCACCAT.AGAAGTACCGGGACCGATCCAG	
Vervet_(Simian)_PCR_product_seq		CCTGGGACGTCG.....GAGGAGCTCCATTGGAAGAGACCGGG.ACCGATCCAG	
Towne_promoter_fr_PCR_prod_seq	1021	CCTCCGGCGCGGGAACGGTGCA	1057
Rhesus_monkey_PCR_prod_821bp		CCTCCATAGCCGGGAAGGGTGCA	SEQ ID NO:20
Vervet_(Simian)_PCR_product_seq		CCTCCATAGCCGGGACGGTGCA	SEQ ID NO:22
			SEQ ID NO:23